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Consequences of ''Minimal'' Group Affiliations in Children

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Three experiments (total $N = 140$) tested the hypothesis that 5-year-old children's membership in randomly assigned ''minimal'' groups would be sufficient to induce intergroup bias. Children were randomly assigned to groups and engaged in tasks involving judgments of unfamiliar in-group or out-group children. Despite an absence of information regarding the relative status of groups or any competitive context, in-group preferences were observed on explicit and implicit measures of attitude and resource allocation (Experiment 1), behavioral attribution, and expectations of reciprocity, with preferences persisting when groups were not described via a noun label (Experiment 2). In addition, children systematically distorted incoming information by preferentially encoding positive information about in-group members (Experiment 3). Implications for the developmental origins of intergroup bias are discussed.

A primary goal of the developing child is the establishment of social identity, a meaningful way of placing him or herself within the fabric of modern society (Harter, 1999). It has long been noted that one way to accomplish this is through membership in socially recognized groups, such as gender, race, or nationality (Tajfel & Turner, 2004). Such social group memberships serve individual identity in several complementary ways. They describe a circle of relevantly *similar* others, fostering connection and interdependence, while at the same time contrasting that in-group with an out-group, picking out relevantly *dissimilar* others, and so providing for converse needs related to uniqueness and independence (Brewer, 1991).

Even before they have been elaborated with detailed content regarding, for example, characteristic properties possessed by members, social categories remake social space, creating an inside and an outside, an in-group and an out-group. What are the psychological consequences of dividing social space in this way? At first blush, one might think they would be modest at best, that the inferential power of social groups resides in the richer dimensions of meaning and inductive potential they eventually acquire. If so, a *mere* categorical distinction, just one among many possibilities, would not have any particular consequences prior to its cultural elaboration. However, the ''minimal group'' phenomenon, one of the most striking bodies of work from adult social psychology over the last several decades, shows that this expectation is wrong.

The Minimal Group Phenomenon

Minimal group research began when Henri Tajfel sought to develop a basic paradigm within which to study the origins of intergroup bias (Tajfel, 1971/2001). Like any good experimentalist, Tajfel sought a flexible procedure within which to manipulate features thought to relate to the formation of intergroup bias. To that end, he devised the minimal group paradigm as a baseline in which participants had no reason whatsoever to favor their group. For example, participants might be grouped based on shared preferences or even random assignment (Billig & Tajfel, 1973; Tajfel 1971/2001). To enduring surprise, these seemingly meaningless social groupings were sufficient to induce preference for the minimal in-group across a wide range of measures, including resource allocation (Locksley,

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Ortiz, & Hepburn, 1980; Tajfel & Turner, 2004), trait evaluations (Locksley et al., 1980), and ''implicit'' measures designed to tap introspectively inaccessible associations in semantic memory (Ashburn-Nardo, Voils, & Monteith, 2001; Otten & Wentura, 1999). The robust nature of the minimal group effect is further attested to by meta-analytic review, which concluded that the minimal group paradigm reliably produces in-group preference of moderate magnitude (Mullen, Brown, & Smith, 1992).

Many theorists considering the origins of intergroup bias have pointed first to social learning, for example, the intergenerational transmission of negative evaluations of stigmatized out-groups (e.g., Bandura, 1977; Devine, 1989; Greenwald & Banaji, 1995). Developmentally focused researchers have also suggested that intergroup bias stems from cognitive limitations in early childhood, such as a tendency to egocentrically assume the superiority of in-groups (e.g., Aboud, 1988; Katz, 1983). Although both social learning and cognitive limitations are likely contributing factors (e.g., Bigler & Liben, 2006), the minimal group findings reviewed earlier suggest that neither are strictly necessary: Intergroup bias can emerge in cognitively mature adults in the complete absence of any relevant social content regarding the worth of groups.

As we review next, the question of whether young children show minimal group preferences remains open. But if they do, it would imply that the field over which the acquisition of intergroup attitudes plays out is not level. Most discussion of minimal group preferences has conceptualized the phenomenon as a basic or ''baseline'' preference for the in-group; such biases are rarely static entities, but rather dynamically interact with other cognitive processes that drive the more general process of category enrichment. That is, a positive attitude toward the in-group might well lead to the preferential acquisition of positive information about the in-group (and perhaps negative information about the out-group). In this way, minimal group biases would constitute an informational gradient systematically biasing children toward in-group-favoring representations, analogous to a confirmation bias (e.g., Oswald & Grosjean, 2004).

In what follows, we review explanations for minimal group effects from adult social psychology and then turn to explanations of intergroup phenomena that have been offered by developmentally oriented theorists. This sets the stage for the two major goals of this article: (a) providing a direct test of minimal group preferences in young children and (b) exploring the consequences of minimal group membership for subsequent information processing, in particular, memory for valenced actions performed by in-group and out-group members.

Theoretical Accounts Relevant to the Minimal Group Phenomenon

An influential class of theories derives the minimal group effect from motivational systems, such as the desire to maintain positive self-esteem. On this account, since one source of self-esteem derives from the groups one belongs to, individuals are motivated to emphasize positive traits associated with the in-group (e.g., Tajfel & Turner, 2004), thereby bolstering self-esteem through membership in favorable groups. However, empirical support for this position has been lacking (for a review, see Rubin & Hewstone, 1998), and indeed other theorists have suggested that the causal arrow runs exactly the opposite way, that in-groups acquire a positive construal by contagion from a self that is *already* positively construed (Cadinu & Rothbart, 1996), a position that has garnered more convincing confirmatory evidence (Otten & Epstude, 2006). Thus, an emerging consensus suggests that minimal group preferences result, at least in part, from self-related positivity, which is extended to in-groups in a relatively automatic fashion.

Developmentalists have also weighed in on these and related findings. Social identity development theory (Nesdale, 2004) postulates that younger children (e.g., 4- to 6-year-olds) are in a stage of ethnic preference, in which motivations related to identity development and positive differentiation lead them to be primarily oriented toward the in-group and engaged in efforts to positively differentiate it from out-groups, although in a way that does not generally involve derogation of those out-groups. Presumably, at these ages children would find means to prefer even minimal in-groups to derive self-related positivity from membership in them.

Another comprehensive account is offered by developmental intergroup theory (DIT; Bigler & Liben, 2006). DIT argues that after a given categorical dimension has achieved psychological salience and been used to form an intergroup contrast, in-group bias will generally appear as children transfer self-related positivity to the groups to which they belong. DIT also emphasizes the role of environmental factors such as explicit labeling, a feature found in most minimal group studies, as a way of making an intergroup contrast salient and sanctioned by the presumably authoritative adult labeler. While these are only a few aspects of a

nuanced theory, DIT provides a basic rationale for predicting minimal group preferences in children.

Minimal Group Research With Children

To examine the body of evidence for and against the presence of minimal group preferences in children, it is important to distinguish between *minimal* and merely *novel* social groups. For our purposes here, *novel* groups are those with which the child has no prior acquaintance; thus, novel groups control for differential exposure to prior knowledge bearing on the groups' importance or status, which could always be present in the case of socially salient distinctions, such as race or gender. *Minimal* groups satisfy several additional constraints. First, the dimension of classification upon which intergroup categorization rests must be value neutral. Second, there must not be between-group competition or unequal status between groups, as these factors have been shown to increase the strength of intergroup biases (Mullen et al., 1992). Third and finally, there must not be opportunity for differential interaction with in-groups or out-groups, which could indirectly lead to preference; this criterion is most easily satisfied in studies in which participants are tested alone such that they never actually meet or interact with in-group or out-group members. All of these conditions serve the same purpose, to remove the influence of independent factors, over and above mere membership in a social group, that could lead to intergroup bias. By way of example, winners and losers of a race might be a novel basis for a social category distinction, but it violates several of the constraints earlier, in that it involves competition and is presumably status relevant and not value neutral (winners being higher in status and likely preferred). As we will see, there is a large body of evidence supporting the claim that children prefer novel in-groups that also differ along other dimensions. However, in the more constrained category of minimal groups, the evidence for preferences in children is mixed.

A series of studies by Bigler and colleagues (Bigler, Brown, & Markell, 2001; Bigler, Jones, & Lobliner, 1997; Patterson & Bigler, 2006) explored the effects of intergroup categorization on real-world social judgments regarding novel social groups. In these studies, children were placed in groups over the course of a 3- to 6-week summer program, and the groups were then ''functionally used'' by teachers, for example, as ways of dividing the children up for activities; in-group preference resulted. These studies demonstrate how intergroup attitudes can emerge in vivo but do not establish minimal group effects according to the strong criteria identified earlier. More specifically, the functional use of groups to structure social environments provides children with an additional social signal that the groups are important, and differential interaction with in-group members potentially introduces additional familiarity effects (e.g., Zajonc, 2001). In addition, Bigler's studies (e.g., Bigler, Spears, & Markell, 2001) generally involved additional factors like status differences between groups or differences in proportional group sizes, each of which is independently related in-group preference (e.g., Mullen et al., 1992). In control conditions lacking these factors, in-group preference was weak or absent, leading Bigler and colleagues (Bigler et al., 1997; Bigler et al., 2001) to emphasize functional use and related factors as contributors to intergroup bias. However, even in these control conditions, Patterson and Bigler (2006) do report in-group favoritism in 3- to 5-year-old children on attributions of positive and negative events and projected group choice of a new individual (although not on several other measures), and Bigler et al. (1997) report in-group bias on a peer-rating measure (but not on other measures) in 6- to 9-year-old children. Thus, although strong interpretations are precluded by mixed results and the extended nature of these studies, they can be seen as consistent with the possibility of minimal group preference in children.

In another series of studies focusing on novel social groups, Nesdale and colleagues (e.g., Nesdale & Flesser, 2001; Nesdale, Durkin, Maass, & Griffiths, 2004) examined intergroup preferences in children as young as 5. Most commonly, these social groups were defined via drawing ability, and consisted of an average and an exceptional ability group. In these cases, both the lower and higher status groups displayed in-group preference. However, this cannot be interpreted as evidence for minimal group preference per se because the groups were defined via a status-relevant distinction. In a more recent study, Nesdale, Griffiths, Durkin, and Maass (2007) included a condition in which participants rated an in-group without knowledge of status differences or expectations of competition. They report a similar degree of in-group preference on this as compared with conditions involving competition, providing another suggestive piece of evidence in favor of minimal group preferences.

These two research programs provide reason to suspect that minimal group effects are present in children, perhaps as young as the preschool years

and certainly in older children. However, direct tests have been scarce. In one of the early studies in the minimal group canon, 7-year-olds showed in-group preference on a resource allocation paradigm (Vaughan, Tajfel, & Williams, 1981). Unfortunately, the specific methodology used in this study has come under some criticism. Most notably, this study used picture preferences as the basis for group assignment. A participant might think picture preferences are diagnostic of other similarities and, on that grounds, come to favor in-group members not merely because of shared picture preference but because of the assumed broader pattern of similarity (Spielman, 2000).

Seeking to overcome this limitation, Spielman (2000) conducted a minimal group study with 6-year-olds using a simpler resource allocation paradigm and random assignment to groups. He found that 6-year-olds *did not* display the minimal group bias unless also provided with a background scenario in which groups were described as preparing to engage in competition. In contrast, adults showed in-group preference even in the absence of the competitive scenario. Based on this result, Spielman (2000) suggested that the minimal group effect is the result of a culturally learned schema not acquired until later in life, in which dichotomous groupings imply competition and conflict (see also Hartstone & Augosutinos, 1995; Lakoff, 1987). On the face of it, this study challenges the thrust of the findings summarized to this point: a failure to find minimal group preferences in 6-year-olds and an enculturation story that accounts for that failure.

However, Spielman's (2000) study is open to critique on several fronts. First, the only dependent measure was resource allocation. As we noted earlier, in adults the minimal group effect appears on many other measures, including attitude, behavioral predictions, and trait attributions. Indeed, resource allocation preferences may be relatively fragile, susceptible to minor differences in task wording that relate to assumptions about intergroup reciprocity (Yamagishi, Jin, & Kiyonari, 1999). Thus, even if Spielman succeeded in establishing that children do not show the minimal group bias on resource allocations, it does not necessarily follow that they would not show it on other measures.

Second, Spielman's (2000) method of group assignment raises concerns. We would only expect intergroup bias when an intergroup categorization has first been made salient and then has actually been used to form a category (for discussion, see Bigler, 1995; Bigler & Liben, 2006). Spielman's method of inducing categorization was fairly subtle. He had children draw a symbol out of a bag (triangle, square, or circle) and told them they belonged to a group corresponding to that shape; later, cups labeled with those same shapes were presented to children, and children were allowed to place coins into those cups to indicate their desired distribution. Was this unfamiliar form of social categorization sufficient to induce 6-year-olds to self-categorize along this dimension, and to understand that cups labeled with different shapes represented individuals belonging to contrasting groups? If not, intergroup categorization would not have occurred and we would not expect to observe minimal group bias.

This leaves us in a situation in which the most direct recent test of minimal group bias in 6- to 7-year-old children failed to find it (Spielman, 2000), but a large body of other work provides suggestive evidence that it might be present. Our first goal here is to provide a more powerful test of the minimal group effect in children in the age range that failed to show it in Spielman's (2000) paradigm (Experiments 1 and 2). Our second is to document the downstream consequences of minimal group bias on subsequent learning about groups, by exploring whether assignment to minimal groups leads to in-group-favoring distortions in event recall (Experiment 3). A supplementary goal was to expand investigation of minimal in-group preferences to less conscious, ''implicit'' forms of attitude. One of the major shifts in adult social cognition research over the past few decades has been the acknowledgment that self-report measures do not exhaust the nature of intergroup evaluations, both because they are susceptible to self-presentational demands and because some forms of bias may simply be introspectively inaccessible (e.g., Greenwald & Banaji, 1995). Indeed, this form of implicit bias is often more predictive of behavioral bias than are self-report measures (Greenwald, Poehlman, Uhlmann, & Banaji, 2009). The development of these implicit forms of social attitude have recently emerged as an important area of study (Baron & Banaji, 2006; Dunham, Baron, & Banaji, 2006, 2007; Rutland, Cameron, Milne, & McGeorge, 2005). A general pattern of results is that implicit social attitudes emerge early and show less developmental change than do their explicit counterparts (reviewed in Dunham, Baron, & Banaji, 2008). Since implicit attitudes are often conceptualized as slow-learned representations of observed statistical regularities (e.g., Greenwald & Banaji, 1995; Smith & DeCoster, 2000), the question of whether they will rapidly emerge following minimal intergroup categorization is particularly interesting.

Experiment 1

Given the divergent findings discussed earlier, in this experiment, we develop a basic paradigm for directly testing the minimal group effect in children. The lack of consistent findings made it important to employ a wide range of dependent measures, corresponding more or less to the range of measures that have shown minimal group effects in adults. This allows us to examine the question of developmental continuity in various forms of minimal group bias. In addition, we designed Experiment 1 in such a way that we could examine in-group gender preference as well as in-group minimal group preference in the same study. Gender bias is well established in children (for reviews, see Miller, Trautner, & Ruble, 2006; Ruble & Martin, 1998), and including both gender and minimal groups will allow us to compare the magnitude of any observed minimal group effects with these well-known gender effects. That is, compared to a well-understood, entrenched form of social preference, how large in magnitude are any effects arising from ''mere'' intergroup categorization in the minimal group paradigm?

Method

Participants

The 33 participants (19 female) were primarily 5-year-olds but also included six older 4-year-olds and two 6-year-olds, mean age = 5.4 (0.35), range = 4;7 to 6;11 years. Boys and girls were similarly aged, boys = 5.5 years (0.25), girls = 5.3 years (0.40). Children were recruited from a laboratory-maintained database at Harvard University, were primarily middle-class and of European American ethnicity (79% European American, 15% Asian American, 6% African American), and were tested in the laboratory. Parental consent was secured in advance of all testing, and participants were compensated with a small toy and a travel reimbursement for parents.

Procedures

After completing parental consent procedures, children were shown a red coin and a blue coin, which were then hidden behind the experimenter's back and shuffled. The experimenter brought her hands forward, with one coin in each hand, and asked the child to select a hand. Depending on the coin selected, the experimenter told the child he or she would now be assigned to a red or blue group. This procedure assigned the child to the red or blue experimental condition. Children then put on a t-shirt of the appropriate color and were told they would now view other children in the red and blue groups on the computer. Children were seated in front of a laptop computer and were taken through the measures described next.

Stimuli

Stimuli were eight full-color head and shoulders photographs of European American boys and girls (four each) between the ages of 5 and 7. Photographs were edited using image editing software such that half the children wore blue and half red t-shirts (for a total of two boys and two girls per color group). Preliminary adult ratings indicated the children in each group were approximately equal in attractiveness. Additional details are provided next.

Measures and Analysis

Measures were undertaken in a fixed order, as follows.

Explicit attitude. Target photographs of children were presented one at a time, in random order, and children indicated their liking for each target on a 6-point scale ranging from a large smile to a large frown. Scale points were verbally labeled as *really like*, *like*, *kind of like*, *kind of don't like*, *don't like*, and *really don't like*, respectively. Mean ratings for outgroup members were subtracted from mean ratings for in-group members, producing an index of group preference.

Resource allocation. On each trial, a pair of targets was presented, either contrasting *group* (red vs. blue, gender held constant; four trials), *gender* (boy vs. girl, group held constant; four trials), or *both* (individuals differed by both group and gender; two trials). Children were told they could distribute up to five coins among the two children any way they liked but that undistributed coins could not be kept. Thus, children did not have to favor one or the other child; they could give 0–2 coins to each child or could make various unequal distributions favoring either child. Children gave coins by placing them in a dish in front of the picture of each child. As rate of giving differed across children, we analyzed data nonparametrically, determining the number of children who showed an allocation preference for their gender or color in-group, and testing this against chance outcomes using contingency table analysis.

Behavioral attribution. On each trial, children again saw a pair of targets, contrasting either *group* (red vs. blue, gender held constant; eight trials), *gender* (boy vs. girl, group held constant; four trials), or *both* (individuals differed by both group and gender; four trials). Children were told they would ''hear about something that somebody did,'' and their job was to decide, in a forced choice manner, who did it. A short behavior was described, with either positive or negative valence (eight each). Positive items included questions like ''Who made cookies for all their friends?'' and negative items included questions like ''Who took some money without asking?'' (full list of items available from the first author). Analyses were conducted on the percentage children selected their gender or t-shirt in-group.

Implicit attitude. We employed the Implicit Association Test (IAT) to measure implicit attitudes (Greenwald, McGhee, & Schwartz, 1998), modified for use with children following Baron and Banaji (2006). The IAT has well-established reliability and validity (summarized in Greenwald et al., 2009; Nosek, Greenwald, & Banaji, 2007), and has now been used in approximately 10 studies with children ranging in age from 5 to 15, with a primary focus on race and gender attitudes (see Olson & Dunham, 2010). In broad strokes, these studies have revealed adult-like implicit in-group preferences in children as young as 6 (e.g., Dunham et al., 2006).

The IAT is a response latency measure of dichotomous categorization, in which participants rapidly classify two kinds of stimuli using the same response button. In this case, one response button is pressed in response to both members of the in-group and positive adjectives, and another response button is pressed in response to members of the out-group and negative adjectives. In a second block of trials, the pairings are reversed such that members of the in-group are now paired with negative adjectives and members of the out-group with positive adjectives. The logic of the IAT is that the task is easier when associated categories share the same response key. Thus, if participants have a positive association with their in-group, they will be faster when the in-group shares a key with positive adjectives. An effect size representing the difference in speed across conditions then estimates the relative strength of this association. In in-group and out-group stimuli were the same group-designating photographs of children described earlier. Positive and negative adjectives were auditory stimuli spoken by a female native English speaker. The IAT effect size, *D*, was computed following the recommendations of a revised scoring algorithm (Greenwald, Nosek, & Banaji, 2003) with the additional modifications put in place for the Child IAT (Baron & Banaji, 2006).

The IAT is a relatively long (180 total trials, approximately 7 min) procedure for 5-year-old children (past data collections have focused on children aged 6 and above; see Dunham et al., 2006, 2007), and as a speeded categorization task, is trying for some children at these ages. As we were worried that some children might have trouble with this task, we fixed it as the last task in the sequence, such that attrition on this task would still leave us with data for that child on other tasks. Of our 33 total participants, 23 provided usable data, with the remaining 10 either failing to complete the task or meeting the exclusion criteria for excessive long or slow latencies or excessive errors (as proscribed by Greenwald et al., 2003).

Results

Overall results, expressed as an effect size for in-group and own gender preference on each measure, are presented in Table 1. As preliminary analyses revealed no effects of participant gender on *minimal group bias* (shirt color) measures, we dropped gender from those analyses and will not report on them here. There were, however, consistent differences by gender in *gender bias*, which will be detailed next.

Explicit Attitude

Participants showed a robust preference for their own gender, regardless of group, with a mean in-gender rating of 4.7 (SD = 1.0) on the 6-point liking scale and a mean out-gender rating of 3.3 (SD = 1.5), $t(32) = 4.03$, $p < .001$ and constituting a large effect (Cohen's d = 1.1). However, this effect

Table 1
Summary of Intergroup Bias Results, Expressed in Cohen's d *(Experiment 1)*

	Gender bias	Group bias
Explicit attitude	1.1***	0.48*
Resource allocation	1.4**	0.71*
Behavioral attribution	0.77***	0
Implicit attitude	NA	1.3**

Note. Effect size for resource allocation measure was calculated using parametric means and thus should be interpreted with some caution.
*$p < .05$. **$p < .01$. ***$p < .001$.

appeared to be driven primarily by girls. Girls, on average, rated their own gender 2.2 scale points above the other gender, whereas boys rated their own gender only about one third of a scale point higher (0.3). This difference in the strength of gender bias was statistically significant, $t(31) = 2.91$, $p < .001$, and the overall in-gender preference was statistically significant in girls, $t(18) = 5.70$, $p < .001$, but not in boys, $t(13) = 0.65$, $p = .53$. The basic finding of in-gender preference, as well as the stronger preference among girls, replicates a large body of literature on children's gender attitudes (e.g., Ruble & Martin, 1998).

Our primary interest is in the effect of group status, that is, the differential evaluations of t-shirt in-groups and out-groups. Participants preferred children from their minimal in-group, with a mean in-group rating of 4.3 ($SD = 1.0$) and a mean out-group rating of 3.8 ($SD = 1.1$). The preference for the in-group was statistically significant, $t(32) = 2.24$, $p = .032$, and represented a moderate effect size (Cohen's $d = 0.48$). Thus, both male and female participants showed a robust explicit preference for their color in-group, though overall this minimal group bias was weaker than gender bias, paired $t(32) = 2.04$, $p = .05$.

Resource Allocation

Participants showed a robust preference for their gender in-group, with 64% favoring their in-group, 21% favoring the out-group, and 15% showing no preference in either direction, results that diverged from chance expectations ($\chi^2 = 7.65$, $p = .022$). Again, this effect was driven by girls, of whom 84% favored the in-group ($\chi^2 = 15.07$, $p < .001$). Among boys, only 36% favored the in-group, a figure that did not differ from chance ($\chi^2 = 0.83$, $p = .66$).

Turning to preference for their minimal in-group, 58% of children showed in-group preference, 21% showed out-group preference, and 21% showed no preference, results that differed from expectations of chance performance at a marginally significant level ($\chi^2 = 5.50$, $p = .064$). Thus, children showed a weak tendency to distribute more coins to their in-group.

Behavioral Attribution

There was again a strong gender preference, with participants attributing more positive behaviors to their own gender and more negative behaviors to the other gender, with the mean percentage of such attributions at 67%, a figure statistically different from chance performance, $t(32) = 4.26$, $p < .001$, and representing a large effect size (Cohen's $d = 0.77$). Again, however, this effect was significantly stronger in girls than boys (78% vs. 51%), $t(31) = 4.31$, $p < .001$, and was individually significant in girls but not in boys, $t(18) = 7.68$, $p < .001$ versus $t(13) = 0.16$, $p = .87$. Thus, girls but not boys reliably showed an in-gender bias on behavioral attributions.

Turning to minimal group bias in attributions, there was little evidence of biased behavioral attributions on the basis of group status. Participants made in-group-favoring attributions on 50% of trials, that is, chance performance. Thus, a bias in behavioral attributions was visible for gender but not for minimal groups. We also wondered if attributions would pattern differently for positive and negative items. The previous literature (Aboud, 2003; Brewer, 1999) has suggested that positive expectations of in-group members do not necessarily entail negative expectations about out-group members and that positive expectations about in-group members may be developmentally prior. Thus, we analyzed the rate of projecting positive behaviors to in-group members separately from the rate of projecting negative behaviors to in-group members, but the data trended only weakly in this direction, with positive actions being extended to the in-group 53% of the time and negative actions being extended to the in-group 49% of the time (*ns*).

Implicit Attitude

Since children did not complete an implicit gender measure, we focus solely on the implicit preference for the color in-group. Positive values of the IAT effect size D indicate a relative preference for the red group over the blue group. Children in the red group tended to implicitly prefer red ($M = 0.39$, $SD = 0.43$), whereas children in the blue group tended to implicitly prefer blue ($M = -0.12$, $SD = 0.38$). Critically, the effect of the group manipulation (i.e., the effect of random assignment to color) was itself significant, $t(21) = 3.02$, $p = .0065$, and constituted a very large effect (Cohen's $d = 1.3$), indicating that random assignment to a color group had a strong effect on implicit preference for the groups.

Relations Between Measures

An advantage of a multimeasure design is the ability to examine relations between preference measures. We therefore ensured that all scores were recoded such that positive numbers indicated more

Table 2
Bivariate Correlations (Pearson's r*) Between In-Group Bias Measures (Experiment 1)*

	2	3	4
1. Explicit attitude	.41†	.36†	.35†
2. Resource allocation		.44*	.50*
3. Behavioral attributions			.49*
4. Implicit attitude			

†$p < .10$. *$p < .05$.

in-group bias, and submitted the set of measures to correlational analysis. Correlations are displayed in Table 2. Interestingly, one of the strongest correlations was between the IAT and the behavioral attributions, $r(18) = .49$, $p = 0.05$. Thus, even though there was no mean-level effect on the behavioral attribution measure, the degree of preference on the individual level was predicted by the degree of positive association with the in-group. The remaining pattern of correlations, typified by moderate-sized significant or marginal correlations between measures even given our relatively small sample sizes, suggests a coherent pattern of bias across measures. Indeed, as a set the items maintained moderate reliability (Cronbach's $\alpha = .75$). A possible explanation for this consistent pattern is that mere membership leads children to globally evaluate in-group members in a more positive way; this general tendency could drive results even across this range of measures. We return to this possibility next.

Discussion

We observed preference for the gender in-group on three of three measures (explicit attitude, resource allocation, and behavioral attribution), although these effects were driven primarily by strong in-gender preference in girls. We also observe preference for the minimal in-group on three of four measures (explicit attitude, resource allocation, and implicit attitude), and this preference did not vary as a function of participant gender. The one measure that did not show in-group preference for a minimal group (behavioral attribution) did show a reliable correlation with implicit attitude such that, on average, participants with stronger implicit in-group preference also made more in-group-favoring attributions. This suggests that while the measure may be a weaker index of minimal group bias at the main effect level, more biased participants were reliably making more biased behavioral attributions. Taken together, these results establish that the minimal group effect is present in children of this age, contrary to Spielman's (2000) result on a resource allocation task with somewhat older children. It is likely that his minimal group manipulation was too subtle, such that it failed to elicit group categorization in many children.

Certainly our results suggest that minimal in-groups are weaker organizers of evaluations than is gender for children of this age; indeed, effect sizes for gender were about twice as large as for minimal groups (at least for girls, who largely drove these effects). On the one hand, this reinforces the central importance of gender as an organizer of social relations in this age range (Arthur, Bigler, Liben, Gelman, & Ruble, 2008). On the other, the fact that a novel, randomly assigned group was able to produce spontaneous preferences about half as powerful as those created by a lifetime in a gender role is a striking testament to the power of even ''minimal'' social categories, suggesting that very little is necessary to induce robust in-group preferences. Indeed, to our knowledge this is the first direct comparison of attitudes toward an actual group and a minimal group in a within-participants design, and thus sheds light on the relative strength of minimal group evaluations.

It is also interesting to note that the strongest effects of the minimal group manipulation emerged on the implicit measure. Adults also rapidly form positive implicit associations with members of minimal in-groups (Ashburn-Nardo et al., 2001). In this way, the implicit evaluative system of 5-year-olds is continuous with the adult system. Those adult studies, however, did not include other measures and did not report effect sizes. Thus, these results are the first to suggest that minimal group effects are larger when measured at the implicit level. In addition, the emergence of implicit attitudes in children over the course of a 15-min study speaks against slow-learning models of implicit attitudes favored by many prominent theoreticians (e.g., Smith & DeCoster, 2000) and instead favors more recent proposals suggesting rapid emergence of implicit evaluations (Duckworth, Bargh, Garcia, & Chaiken, 2002; Dunham et al., 2008). From quite early in the process of acquiring rich social category representations, the mere presence of an in-group/out-group contrast is enough to set the stage for a range of in-group preferences.

Experiment 2

Given Spielman's (2000) finding of no bias in the absence of a competitive prime, we wanted to

ensure the reliability of our basic effects. Experiment 2 sought to replicate and extend the results of Experiment 1 while also addressing several potential issues in the first study. First and foremost, in Experiment 1 the two groups were explicitly labeled the ''red group'' and ''blue group.'' There is a large developmental literature pointing to the importance of noun labels in promoting categorization; most generally, they invite kind-based reasoning and so promote stronger inferences, both outside (Gelman, Hollander, Star, & Heyman, 2000; Markman, 1989) and inside (Gelman & Heyman, 1999) the social domain. In this context, it is worth noting that minimal group experiments have generally used explicit group labels of this sort (however, cf. Nesdale et al., 2004; Nesdale et al., 2007; who described groups via noun phrases such as ''your group,'' ''the other group'') and that in related contexts group labels appear to increase the strength and polarization of intergroup attitudes (Patterson & Bigler, 2006), and may even be necessary for the emergence of bias in older children (Bigler et al., 1997; Bigler et al., 2001). Experiment 2 explores whether the minimal group effect would appear as robustly in the absence of such labels. A positive answer to this question would suggest that the minimal group effect may stem as much from the perception of a shared property as from the membership in a shared category.

In addition, it has been suggested that expectations of in-group reciprocity, potentially of evolutionary origin (Yamagishi et al., 1999), underlie the minimal group effect, especially the effect of group membership on resource allocation. That is, individuals favor in-group members because of a generalized assumption of extended reciprocity such that in-group members are expected to give more to one another. Does this underlie the broader set of intergroup biases observed here? If so, we should be able to observe a tendency to assume in-group reciprocity; that is, children should expect to receive more from in-group members than out-group members.

Method

Participants

The sample contained 43 primarily 5-year-old participants (female = 25), mean age = 5.5, range = 4;6 years to 6;5 years, although it also included five older 4-year-olds and six younger 6-year-olds, with roughly equal ages of each gender, boys = 5.4 years (0.56), girls = 5.6 years (0.48). The ethnic composition was again primarily European American (77%) but also included 6% Asian American participants and 7% whose ethnic membership was unspecified. All additional information was as reported in Experiment 1.

Procedures

The procedure was identical to that in Experiment 1 except for the following changes. Owing to a slight trend toward a baseline preference for red in the prior study, we used orange and green as the two group colors. More important, rather than being told they belonged to ''the green group'' or ''the orange group,'' children were simply told they would wear a shirt of that color, and photographs of children in subsequent experimental stimuli were described as ''someone wearing an orange (green) shirt.'' While this clearly conveys verbal information that can assist in categorization, it is a descriptive phrase rather than a noun phrase, and prior work focusing on just this distinction has revealed children's tendency to make considerably stronger inductive inferences in the case of the latter (e.g., Heyman & Gelman, 1999). Children were seated in front of a laptop computer and were taken through the measures described next.

Stimuli

Stimuli were 12 full-color head and shoulders photographs of Caucasian boys and girls equated for attractiveness via adult ratings (six per gender) between the ages of 5 and 7, edited such that half the children wore green and half orange t-shirts. All were gender-matched to the participant such that boys viewed only boys and girls viewed only girls.

Measures and Analysis

To ensure that effects reported in Experiment 1 did not depend on the (fixed) task order, the following measures were presented in random order.

Explicit attitude. The explicit attitude measure and analysis were identical to that in Experiment 1, except that there were six trials and, as noted earlier, gender was fixed.

Resource allocation. The resource allocation measure and analysis were identical to that in Experiment 1, except that there were nine trials and gender was fixed.

Behavioral attribution. Although the behavioral attribution measure did not reveal mean-level

in-group preference in Experiment 1, it did correlate with other measures, suggesting that it was tracking evaluation at the individual level. To further explore the effects of minimal group assignment on negative and positive attributions, we increased the number of group-contrasting trials to 16 by eliminating the gender contrast (i.e., participants always saw in-gender targets). In addition, we explored whether effects might hold for some kinds of attributions but not others by including intentional single actions (eight items; e.g., ''took some money without asking,'' ''helped a friend with her homework'') and events with positive or negative valence for which the actor was not responsible (eight items; e.g., ''had a soccer game canceled because of rain,'' ''found $5 on the street''). This distinction allows us to see if children expect their in-group to generally be associated with positive events, irrespective of their agency (for more on the distinction between general positivity/negativity and positive and negative intentional actions, see Olson, Dunham, Banaji, Spelke, & Dweck, 2008). The complete list of items is available from the first author.

Expectations of reciprocity. We created four items that examined children's expectations about in-group and out-group members. Children viewed a child wearing a same-color and different-color t-shirt side by side and indicated who they thought would behave in a generous manner toward them. Questions primarily involved sharing (who would definitely share their lunch with you); the complete list of items is available from the first author.

Implicit attitude. As a final measure, all participants completed the IAT as in Experiment 1. We did not involve this measure in the randomization of measures because in pilot testing its length and difficulty for some children made it difficult to get children to re-engage with additional tasks after completing the IAT; therefore, we fixed it as the last task in the experimental procedure. Other than fixing gender and changing the t-shirt color of children in the stimuli photographs, this measure was identical to that in Experiment 1. Of 39 total participants, 30 successfully completed the IAT portion of the experiment.

Results

Except where noted, preliminary analysis revealed no effects of participant gender or color in-group, so we collapsed across these factors in all subsequent analyses. A summary of results across measures, expressed as effect sizes, is presented in Table 3. Experiment 1 provided us with reason to expect in-group preferences on a wide range of measures; given this a priori prediction, we used one-tailed hypothesis testing in what follows.

Table 3
Summary of Intergroup Bias Results, Expressed in Cohen's d *(Experiment 2)*

	Group bias
Explicit attitude	0.34†
Resource allocation	0.10
Behavioral attribution	0.26*
Expectations of altruism	0.35*
Implicit attitude	0.79*

Note. Effect size for resource allocation measure was calculated using parametric means and thus should be interpreted with some caution.
†$p < .10$. *$p < .05$.

Explicit Attitude

Participants in this experiment preferred their in-group, with a mean in-group rating of 4.5 ($SD = 1.0$) and a mean out-group rating of 4.2 ($SD = 1.4$). This constituted a marginal effect, $t(42) = 1.41$, one-tailed $p = .08$, Cohen's $d = 0.30$. Thus, there is a suggestion of in-group preference, but it may be that differences in labeling attenuated the stronger effect observed in Experiment 1, a possibility to which we will return.

Resource Allocation

There was a trend toward favoring the in-group in resource allocation, with 51% favoring their in-group, 40% favoring the out-group, and 9% showing an equal distribution. While in the expected direction, this distribution did not differ from chance expectations ($\chi^2 = 1.89$, one-tailed $p = .20$). Thus, unlike in Experiment 1, participants did not appear to favor their in-group on the resource allocation measure.

Behavioral Attribution

Participants were slightly more likely to favor their in-group, with 54% ($SD = 0.16$) of total attributions doing so, $t(42) = 1.66$, one-tailed $p = .05$, a small effect size (Cohen's $d = 0.26$). Interestingly, the weak trend we observed in Experiment 1 was clearer here, as the *valence* of the event was an important predictor of children's attributions. Children assigned negative actions and events equally to the in-group and out-group, $M = 49\%$,

$t(42) = -0.33$, $p = .74$, but assigned more positive actions and events to the in-group, $M = 60\%$, $t(42) = 2.31$, $p = .03$, and this difference was itself marginally significant, paired $t(42) = 1.83$, $p = .07$. Thus, there seems to be a valence asymmetry, such that children may rapidly acquire *positive* expectations about their own group without acquiring negative expectations of the out-group. Whether the event described was an intentional action or a random event did not affect the rate of attributions (*M*s = 54% and 55%, respectively), suggesting that children were equally likely to expect in-group members to perform positive actions and to experience positive outcomes.

Expectations of Reciprocity

Children expected reciprocity, that is, expected preferential treatment from a member of their in-group, on 61% of trials ($SD = 0.32$), a figure that was different from chance expectations, $t(42) = 1.86$, one-tailed $p = .03$, and represented a small to moderate effect size (Cohen's $d = 0.35$). That is, children expected more giving and other positive participant-directed behaviors from members of their in-group than from members of their out-group.

Implicit Attitude

Positive values of the IAT effect size *D* indicate a relative preference for the orange group over the green group. Children in the orange group tended to implicitly prefer orange ($M = 0.29$, $SD = 0.34$), whereas children in the green group did not show a clear preference ($M = -0.01$, $SD = 0.38$). Critically, the effect of the group manipulation was itself significant, $t(31) = 2.16$, one-tailed $p = .018$, and a large effect (Cohen's $d = 0.79$), indicating that random assignment to a color group had a strong effect on implicit preference for the two groups.

Relations Between Measures

A full table of correlations is presented in Table 4. We observed statistically significant correlations between implicit attitude and resource allocation, $r(31) = .41$, $p = .022$; explicit attitude and resource allocation, $r(39) = .35$, $p = .027$; and a marginally significant correlation between expectations of reciprocity and resource allocation, $r(39) = .31$, $p = .058$. This pattern is similar to that observed in Experiment 1, if somewhat smaller in magnitude overall.

Table 4
Bivariate Correlations (Pearson's r) Between In-Group Bias Measures (Experiment 2)

	2	3	4	5
1. Explicit attitude	.35*	.12	.17	.15
2. Resource allocation		−.20	.31†	.41*
3. Behavioral attributions			.15	.09
4. Expectations of reciprocity				.15
5. Implicit attitude				

†$p < .10$. *$p < .05$.

Discussion

Confirming the results of Experiment 1, we found evidence of intergroup bias on several measures, notably, behavioral attribution and implicit attitude. In addition, consistent with the hypothesis that in-group positivity reflects expectations of reciprocal altruism, we found evidence that 5-year-olds have the expectation that their in-group is more likely to reciprocate with them. Although our measure is not strong enough to support definitive conclusions regarding these expectations (see further discussion next), this result suggests that children do have some additional beliefs about within-group interactions, such as expecting preferential treatment from even minimal in-group members. This result is consistent with the possibility that children are not merely forming positive *attitudes* toward the in-group but are generating a set of theory-like beliefs about how members of in-groups relate to one another (e.g., Kalish & Lawson, 2008).

The results from Experiment 2 differed from those of Experiment 1 in a few respects. Participants in Experiment 2 did not allocate more resources to members of their in-group. The transitory nature of resource allocation biases has been elaborated on in recent research (Yamagishi et al., 1999), and given that most adult minimal group research has employed *only* this measure, it is possible that the larger literature actually underestimates the strength and widespread prevalence of minimal in-group preferences.

More generally, Experiment 2 confirms the presence of minimal group effects in children in this age range, although the general trend was for weaker effects than in Experiment 1 (compare Tables 1 and 2). While several other differences across studies preclude direct statistical comparison, this general trend is consistent with the developmental literature on the tendency of noun labels to increase the inductive potential of categories and promote more coherent, kind-based reasoning (e.g., Markman,

1989) and also fits nicely within Bigler and Liben's (2007) DIT, in which group labels are thought to play the fundamental role of pointing children in the direction of a socially sanctioned way of dividing individuals into groups. It is also possible that the role of labels actually increases in importance with age. Patterson and Bigler (2006) found several forms of intergroup bias both with and without labeling in preschool children, while studies with older children in a similar paradigm tended to find that bias was not present in the absence of labeling (Bigler et al., 1997; Bigler et al., 2001). Thus, exploring the role of labeling across a wider age range could be interesting for future work.

While Experiments 1 and 2 differed with respect to the way groups were described (noun labels in Experiment 1 and predicate descriptions in Experiment 2), both did verbally mark the relevant intergroup contrast. An open question is whether our reported effects depend on a salient visual distinction that is also verbally marked. Would bias appear in the absence of any form of verbal marking? Would they appear with *only* a noun label and no visual distinction? However, the presence of intergroup bias in Experiment 2 suggests that a visually apparent shared property is sufficient to induce preferences in the absence of explicit category labels.

There was one measure for which an effect was absent in Experiment 1 but present in Experiment 2: behavioral attributions. In Experiment 2, we found that bias in attributions was driven by positive items, which were preferentially extended to the in-group. As noted, there was a weak trend in this same direction in Experiment 1, but it did not reach significance in that study. The reasons for this difference are not immediately clear, but it is possible that children focused primarily on gender when making behavioral attributions in Experiment 1, washing out an effect of group on that measure. In addition, the items in Experiment 1 included both individual behaviors and habitual behaviors or traits; it is possible that children are more willing to make minimal group attributions based on individual behaviors (which were included in Experiment 2) than traits (which were not included in Experiment 2), a question worthy of future follow-up. In any case, the valence asymmetry revealed in Experiment 2 is interesting in relation to the discussion of whether in-group preference or out-group derogation (or both) is present in children. This finding is compatible with a privileged or developmentally prior role for in-group preference (Aboud, 2003; Brewer, 1999; Nesdale, 2004) in that children seemed to assume that the in-group would perform more positive but not necessarily less negative actions. However, there is something puzzling about this finding, in that even if the cognitive structure of early bias were merely in-group preference, one might have thought that children would ''solve'' the negative items through contrast (''my group is good, so it probably didn't do the bad thing''). That they did not suggests that positive and negative behaviors are encoded in a surprisingly distinct manner.

All of the minimal group effects from both Experiments 1 and 2, including the less simply evaluative expectations of reciprocity and behavioral attributions, are open to two subtly different interpretations. First, the widespread evidence of in-group bias we found among 5-year-olds may reflect a rich set of interrelated in-group-favoring cognitions already in place at this young age, such as a generalized expectation that members of the in-group are more positive, more generous, and so on. Supporting this possibility, Experiments 1 and 2 conclusively establish that the minimal group bias is in place at this age, and that the various reflections of it are interrelated, in that they are positively correlated across participants. Second and alternatively, the minimal group manipulation may simply establish a positive valence associated with the in-group (and, perhaps, a negative valence associated with the out-group) and then these drive task performance. On this interpretation, it is not that children *expected* positive behaviors out of the in-group, or that they *expected* members of the in-group to share with them; rather, they generated such expectations in response to the experimenter's questions. On this reading, all of the measures essentially become indirect measures of attitude. The fact that children were as likely to judge members of the in-group likely to experience lucky outcomes as they were to judge that they would perform positive actions is consistent with this second interpretation.

Whatever the source of the in-group biases we observe in these experiments, the question arises as to their consequences. There is some evidence in adults that minimal group biases are capable of influencing learning about individuals according to whether they are in the in-group or the out-group (Howard & Rothbart, 1980). Experiment 3 asks whether this is also true for young children. If so, the mere presence of minimal social groups could create a cascade of differential learning that could support the emergence and entrenchment of intergroup bias.

Experiment 3

Experiment 3 tests the hypothesis that the minimal group bias constitutes an organizational template that affects the acquisition of group-relevant information, biasing learning in in-group-favoring ways. There is a substantial literature demonstrating that children use socially learned stereotypes to organize memory (e.g., Averhart & Bigler, 1997; Koblinsky & Cruse, 1981; Koblinsky, Cruse, & Sugawara, 1978; Kropp & Halverson, 1983; Liben & Signorella, 1980; Nesdale & Brown, 2004). In general, this body of work shows that children will preferentially remember information that is consistent with a preexisting stereotype or with a newly learned schema provided by the experimenter immediately prior to the learning phase. These findings have been taken to demonstrate that children use preexisting and/or currently active schemas as templates for future knowledge assimilation. The current question is whether randomly assigned minimal groups, for which no stereotypes and thus no schemas have been learned or made salient, will similarly organize memory around the simpler dimension of valence. If the answer is ''yes,'' it would suggest that children are capable of rapidly generating a basic, valence-based schema even in the absence of any evidence regarding valence, a finding of considerable import to understanding the developmental unfolding of social preferences.

Children were read two stories, one featuring an in-group protagonist and one an out-group protagonist. In each story, the protagonist engaged in several positive and negative behaviors. Children's memory for the positive and negative behaviors was then assessed. We hypothesized that children would tend to remember more positive actions performed by in-group members and more negative actions performed by out-group members.

Method

Participants

The sample contained 64 primarily 5- to 6-year-old participants (female = 32), mean age = 5;8, range = 4;6 to 7;1 years, with a total breakdown of two older 4-year-olds, twenty-six 5-year-olds, thirty-four 6-year-olds, and two younger 7-year-olds, with approximately similar ages within each gender, boys = 5.7 years (0.53), girls = 5.9 years (0.87). Participants were recruited from both a laboratory-maintained database and a local preschool, and were primarily working to middle class and European American (69%); in addition, the sample included 16% Hispanic American, 13% Asian American, and 3% African American participants. As a result of an external interruption of the procedure, one participant was dropped from data analysis, resulting in a usable sample of 63 children.

Procedures

The minimal group induction procedure was modeled after that used in Experiment 1, with explicit labeling but with green and orange group colors. Participants were randomly assigned to one of the two groups or to a control group; control group children were randomly assigned to a group in the same manner as experimental group children but heard stories about children from two different groups (blue and red). Thus, control group children were assigned to a group that did not figure in the stories that followed. By comparing ''baseline'' recall rates for those in the control group with children in the experimental group, we can thus ascertain the direction of effects. Children were seated in front of a laptop computer, were read two group-relevant stories, and were then taken through the measures described next.

Stimuli

The same photographic stimuli from Experiment 2 were employed here. While viewing the face of a single gender-matched child, children were read one of two stories, in which the pictured protagonist (a same-gender in-group or out-group member, except in the case of control participants, who heard two stories about two different out-group members) engaged in four positive and four negative behaviors. Thus, participants heard an in-group story and an out-group story in which an equal number of positive and negative behaviors were performed; the stories were counterbalanced such that order of story (in-group first or out-group first) and the story pairing (whether a given story was paired with the in-group or the out-group character) varied as a between-subjects factor. Both stories were written in the fashion of a children's book and were approximately 650 words in length. One story concerned a walk on the beach during which the child encounters several classmates. The other focused on a child's search for a notebook that went missing from his or her cubby. Stories are available from the first author upon request.

Measures and Analysis

The following measures were presented in fixed order.

Free-recall memory test. Immediately following each story, children were asked ''what do you remember most about that story?'' Children's first response was recorded; if, as often occurred, the first recall was a narrative element not connected with positive or negative story elements, the child was prompted with ''Do you remember anything nice or mean that s/he did?'' up to three more times, until all prompts had been exhausted or the child indicated that he or she did not remember anything else. The dependent measure is the number of positive and negative behaviors recalled for each story.

We opted for a free-recall memory test because they are generally considered superior to recognition tests for investigating biases in memory (Signorella, Bigler, & Liben, 1997). First, they provide increased ecological validity, as most real-world instances of recall do not come with a menu of possibilities from which one must merely choose. Second, recognition tests risk confounding a general positivity or negativity bias with actual recall. Remember that Experiment 2 demonstrated a tendency to attribute positive actions to members of the in-group; if a recognition memory task showed improved recall of positive actions performed by the in-group, it would be difficult to establish that this constituted a *memory* bias rather than just a replication of that *attributional* bias. Thus, we opted for free recall as our primary dependent measure.

Playmate preference. Immediately following the memory measures, children were asked which child they would rather play with, and their forced-choice response was recorded. For this measure, only data for participants in test conditions were included, as control participants heard two out-group stories and so none of the playmates presented were in an in-group. This resulted in a final sample of 45 children for this measure.

Results

Except where noted, preliminary analysis revealed no effects of participant gender or color in-group, so we collapsed across these factors in all subsequent analyses.

Free-Recall Memory

Mean memory rates are presented in Figure 1. We compared rates of recall for children in the test condition using a repeated measures analysis of variance with two within-participant factors (valence: positive or negative; group: in-group or out-group). This analysis revealed a general tendency to remember more negative actions than positive actions (1.3 negative vs. 0.64 positive actions recalled; main effect of valence), $F(1, 44) = 56.43$, $p < .001$. On the other hand, there was no difference in mean recall rates as a function of group; that is, memory was equal for in-group and out-group actions; main effect of group, $F(1, 44) = 0.61$, $p > .44$. Critically, these main effects were qualified by a predicted Group × Valence interaction, $F(1, 44) = 4.02$, $p = .05$, indicating that the tendency to recall more negative than positive actions was considerably weaker when the actions were performed by an in-group member. Planned contrasts revealed that this effect was driven primarily by recall of positive actions; positive actions were more frequently recalled for in-group members than for out-group members, $t(44) = 2.41$, $p = .02$, whereas recall of negative actions did not vary as a function of group, paired $t(44) = -1.23$, $p > .23$.

Members of the control group evidenced the same tendency to recall more negative than positive actions (1.18 negative vs. 0.53 positive actions), main effect of valence, $F(1, 17) = 8.87$, $p < .01$, but there were no effects of story on memory ($p > .09$) and no interaction between story and item valence ($p > .36$). Mean rates of recall did not differ for the experimental and control groups, 3.9 total items

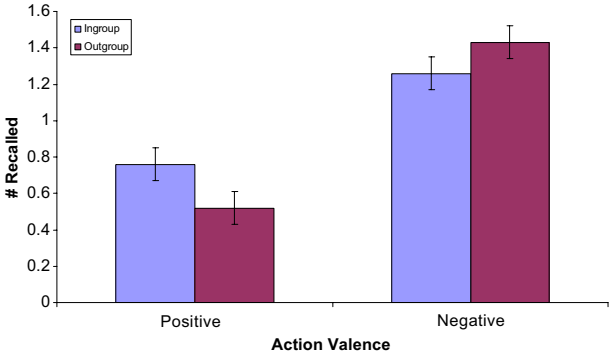

Figure 1. Free recall in Experiment 3, as a function of group (in-group or out-group) and action valence (positive or negative), expressed as the mean number of actions recalled (of four total actions).
Note. Error bars represent standard errors of the mean values.

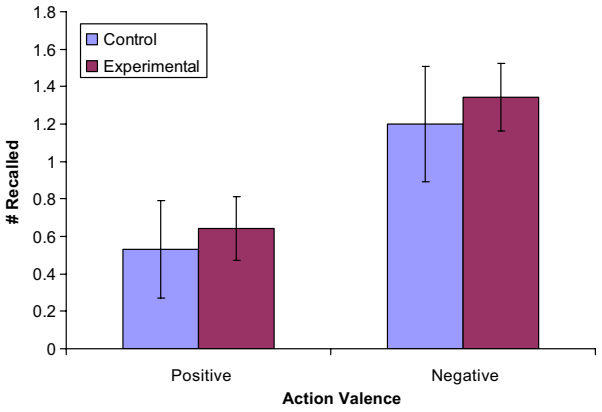

Figure 2. Free recall in Experiment 3, as a function of condition (experimental or control) and action valence (positive or negative), expressed as the mean number of actions recalled (of four total actions).
Note. Error bars represent standard errors of the mean values.

and 3.4 total items, respectively, $t(61) = 1.10$, $p = .28$, suggesting that *merely* hearing a story about a group to which you belong did not enhance memory.

Playmate Preference

In the test conditions, 45 children provided a definitive response to the playmate preference item. Of these, 28 indicated a greater desire to play with the in-group member, 13 indicated a desire to play with the out-group member, and 4 indicated a desire to play with both. These frequencies differed from chance, $\chi^2 = 5.49$, $p = .01$, one-tailed. Thus, the minimal group manipulation led to an in-group playmate preference.

Discussion

Experiment 3 confirmed the in-group bias created by mere membership in a minimal group that was also seen in Experiments 1 and 2; in Experiment 3, the relevant measure was playmate preferences. But the important new result from Experiment 3 is evidence of in-group-favoring memory biases in young children in a minimal group context. Children heard about the behavior of an in-group member and an out-group member. This information was equivalent, in that the in-group and out-group protagonists engaged in an equal number of positive and negative behaviors (and in fact across participants counterbalancing ensured that the same actions were alternately performed by in-group and out-group protagonists). Children's free recall of these stories, however, diverged markedly from the equivalence of the input. While there was a general tendency for better recall of negative behaviors (replicating prior work with adults; for a review, see Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001), this tendency was considerably weaker for the story involving an in-group protagonist. That is, children showed enhanced memory for the positive action of in-group members, demonstrating a bias in information processing with respect to in-group and out-group targets. Because the measure employed was free recall, children could not simply be matching positive actions with the in-group, as they could in prior results reported here. In addition, participants could not have been drawing on a previously learned schema, since no schema-relevant information was provided—indeed, no information regarding the two groups, other than the child's membership in one, was provided! Thus, Experiment 3 demonstrates a systematic tendency to encode information in a way favorable to even the most minimal of in-groups. Interestingly, like behavioral attributions in Experiment 2, this result is best interpreted as a positivity bias in favor of the in-group; negative actions performed by out-group members were not preferentially encoded. Thus, this lends further support to the notion that in-group preference may precede out-group derogation (Aboud, 2003; Nesdale, 2004).

Finally, these results provide strong evidence that a previously learned cultural knowledge schema is not the only causal means by which group-based memory distortions can emerge. Because these were minimal groups, either such a schema is not necessary, or it can be generated quite rapidly, perhaps by assuming some sort of self-group correspondence in valence (e.g., Bigler & Liben, 2006; Otten & Epstude, 2006).

General Discussion

Across three experiments, we found moderate to large effects of in-group favoritism across several measures. These data definitively show that ''mere membership'' in minimal social groups is enough to elicit intergroup bias in 5-year-olds, *contra* Spielman (2000). While we interpret this as evidence against Spielman's enculturation view, it is not definitive: It could be that enculturation merely happens earlier, that 5-year-olds have already come to think of dichotomous groups as templates for competition. However, one of the most striking aspects of our findings is the wide range of biases we observed. Spielman's explanation, as well as other

explanations that sought primarily to account for resource allocation behavior (Tajfel, 1971/2001; Yamagishi et al., 1999), face some difficulty here. There is no prima facie reason why an understanding of dichotomous groups as likely parties to competition (or generalized expectations of extended in-group reciprocity) should automatically lead to preference for members of the in-group, a tendency to predict more positive behaviors for in-group members, a positive implicit association with the in-group, and distorted memory for in-group and out-group actions. After all, these effects have little to do with reciprocity or conflict per se.

Instead, these data suggest that an adequate characterization of the minimal group effect will need to respect the generality of findings; that is, candidate mechanisms will need to be capable of producing bias across many dependent measures. One speculative possibility that we favor is that the driving force behind the minimal group effect is the general affective positivity that implicit measures tap into. Besides revealing the strongest effects of mere membership in Experiments 1 and 2 and correlating with several of our other measures, implicit attitudes have well-established relations with a range of discriminatory behaviors (Greenwald et al., 2009) and thus could underlie the varied findings reported here and elsewhere. This general positivity toward in-groups could be part of a broader tendency to affiliate with social coalitions, purported to be an adaptive process of evolutionary origin (e.g., Kurzban, Tooby, & Cosmides, 2001).

Regardless of mechanism, these results provide strong evidence that mere categorization into in-groups and out-groups produces a wide-ranging set of in-group-favoring biases. These biases emerge rapidly, are moderate to large effects, and do not require any supporting social information whatsoever. Equally importantly, our results suggest that group-relevant information is pervasively distorted by mere membership in a social group, a finding with disturbing implications. If children assume that members of the in-group are more likely to perform good actions and are generally more likable, if they are more likely to encode positive actions performed by in-group members, then over time initial biases will take root by, in essence, shifting perception to produce confirmatory evidence. The minimal group effect must therefore be considered a powerful learning bias underlying the rapid internalization and entrenchment of social biases in the real world.

Of course, groups in the real world differ from the minimal in many important respects. Most notably, they are rife with cultural meaning and socially reinforced in myriad ways, for example, by being ''functionally used'' in language and social organization (Bigler & Liben, 2006) or otherwise providing a hierarchical structure to social life (Sidanius & Pratto, 1999). Why, then, are minimal group biases relevant to children's learning about actual groups? Answering this question requires asking whether these richer dimensions of meaning are always present and, in particular, whether they are present during children's early encounters with new social groups. Anecdotally, children often exhibit ''aha moments,'' in which they suddenly notice and remark upon a grouping dimension (e.g., ''Mommy! That man is chocolate!''). In this moment, it seems unlikely that the child has any grasp of the complicated sociohistorical meaning of race or the role it plays in the wider society. Rather, the child has simply identified a way of categorizing individuals and has created an in-group/out-group boundary based on (for her) a novel grouping dimension. She is, in short, in a position closely analogous to a minimal group setting.

If this line of reasoning is right, it suggests that actual social groups are initially minimal in at least this nontrivial sense: They are based on recognition of a grouping dimension (e.g., skin color, language spoken) that separates individuals into in-group and out-group categories in the absence of additional rich information about the culturally constructed meaning of groups. Of course, as many have pointed out, socially reinforced groupings (e.g., race but not eye color) will rapidly acquire more importance and will become widely shared in a given culture (e.g., Bigler & Liben, 2006). But it could nonetheless be the case that minimal group biases operate during the early acquisition of richer knowledge about these groups, and in so doing structure learning about social groups in a way that produces in-group-favoring representations. Indeed, one reading of the data we have presented here is as a proof of concept that *even when the input is neutral, minimal group biases can reorganize input to produce* in-group *favoritism.*

The minimal group phenomenon can also help to clarify a few broader patterns of findings emerging from the developmental intergroup literature. For example, in-group preferences with respect to many salient real-world social groups emerge quite early, in close temporal synchrony with category acquisition itself. That is, at least for members of the majority, the same age that children acquire a given social group distinction seems to be the age at which they acquire in-group preference with

respect to that distinction (for race [ages 3–4], see Aboud, 1988; for nationality [ages 6–7], see Barrett, 2007; for gender [age 3], see Martin, Ruble, & Szkrybalo, 2002). Additionally, when attitudes toward multiple out-groups have been assessed in the same design (Dunham et al., 2006; Sigelman, Miller, & Whitworth, 1986), young children seem to show an equivalent degree of bias regardless of the social status of those out-groups (as revealed by adult judgments). That is, young children's initial attitudes can be explained by a simple in-group/out-group contrast wherein the in-group is preferred, while adults' attitudes also reflect cultural norms regarding the consensual status of those groups.

Of course, it is clear that the overall developmental picture cannot be this simple. After all, neither children nor adults always show in-group preference, with factors like social status (Bigler et al., 2001), minority status (Dunham et al., 2007), being educated in diverse schools (McGlothlin & Killen, 2010), and other forms of direct and indirect intergroup contact (Aboud, Mendelson, & Purdy, 2003; Cameron & Rutland, 2006) all moderating the degree of bias shown. In addition, even at the ages during which children express in-group preferences, they do not necessarily engage in discriminatory behavior or show race-based playmate preferences (e.g., Graham & Cohen, 1997). This may be because subtle biases such as those revealed in the current research lose out to other factors such as norms against exclusionary and other forms of discriminatory behavior (e.g., Killen, 2007). Thus, minimal group preferences may represent a default response to the perception of social difference, but they are only one process among many. Future work should investigate individual differences in this default, as well as the ways in which it interacts with other processes that lead toward and away from intergroup bias.

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